Agriculture is one of the most complex and dynamic expressions of human primary activity performed with interaction of several elements. Hitherto, in the recent times, the novel theme of 'modernization' of agriculture based on the development of science and technology has brought about a revolutionary change in the scenario of agriculture, especially, in the developing countries like India. Above all, the present multi-dimensional multi-variable complex nature of agriculture spectrum is to be scientifically and systematically classified for comprehensive understanding of the spatial organisation of agriculture. In the process of systematic classification of agriculture, agricultural typology is considered as one of the most recent methodical tools and an empirical model to understand and to illustrate the complex and the composite nature of agriculture. As far as typology is concerned, the agricultural type
is the end product essentially based on similarities between individuals of inherent attributes of agriculture. The typification of agriculture will constitute a good basis for agricultural regionalisation. The identification of traditional, transitional and dynamic areas on the basis of typification of agriculture is of paramount importance from the point of planning to achieve sustainable agriculture development. In the areas where agriculture is the main source of economy, there is tremendous urge to search for typological studies at micro-rational scale for regional agricultural development and economic planning. It is in this perspective the present study of agricultural typology of Chittoor district is conceptually designed and attempted to understand the complex nature of the spatial organisation of the agriculture in the district at different hierarchical levels. It is hoped that this diagnostic study would immensely help to evolve both prophylactic and curative measures ultimately to improve the agricultural economy of the district.

Obviously, the present study area, Chittoor district, with its diverse physical and socio-economic conditions as well as rich agricultural resources and development, indeed has been provided an appropriate setting for the study. The economy of the Chittoor district is predominantly agricultural and consequently the development of agriculture is crucial and forms the basis of the economic development of the district. The district has good agricultural potential for developing a prosperous and opulent agriculture if some of the agricultural problems of the district are solved.

About one-third of the geographical area in the district is under cultivation with 40 per cent of the cultivated land under irrigation. The district produces large quantities of groundnut, paddy, sugarcane, ragi, fruits and milk. The district is known
for small scale intensive agriculture. In addition, as much as 73 per cent of the district’s work force is engaged in agriculture.

**Objectives of the Study**

For providing a comprehensive plan to develop agriculture in Chittoor district, it is imperative to gain insights into the spatial organisation of agriculture through the process of agricultural classification. The significant aspect of the study is to identify agricultural types at different hierarchical orders ranging from individual sample agricultural holdings through administrative units, example sample villages, mandals, divisions and to the types of the district agriculture. Another important objective of the present investigation is to identify the weak and traditional base among the different farming communities in terms of agricultural development. The analysis in the study is made at different levels namely, sample agricultural holdings, sample villages, mandal administrative units, and revenue divisions for a single point of time 1991-92 year.

**Locational and Spatial Aspects:**

Chittoor district is the sixth largest district both in terms of area and population located in the southern most part of the semi-arid as well as backward Rayalaseema region. Morphologically, the district lies in traditional zone between the interior Deccan plateau and the Coastal Plain. The hills and uplands are found on the western part, while, the plains on the eastern part of the district. In between the two natural divisions there lies the traditional zone in which the terrain consisting of number of valleys. There are no perennial rivers in the district. The non-perennial minor rivers and seasonal streams constitute the chief drainage system and also functions as
source of ground water development which largely influences the agricultural
development of the district. A major part of the district is covered by red soils, which
accounted for 94 per cent of the total soil cover. Climatically, the district comes under
semi-arid type. The average annual rainfall of the district is 827.5 mm. Out of the total
rainfall, 44 per cent rainfall receives from south-west monsoon, 41 per cent rainfall
receives from north-east monsoon. The amount of the rainfall is very high in the
eastern plains, while it is very low in the western uplands. The occurrences of droughts
and prolonged dry spells are not uncommon in the district and have had a debilitating
effect on its agricultural economy. The district has a rich forest cover which accounted
for more than 30 per cent of the total geographical area of the district.

The total population of Chittoor district is 32,56,247. The density of population
is 215 persons per square Kilometer and the rural population accounted for 80.18 per
cent of the total population of the district. The literacy rate of the district is 43.04 per
cent which is significantly higher than the average literacy rate of 45.11 per cent in the
state. The district has occupied 4th rank in the literacy rate among 23 districts of the
state. Out of the total working population of the district, 73 per cent is engaged in
agriculture which is slightly higher than the State’s average of 69.8 per cent. It shows
that agriculture is the chief source of livelihood of the people as well as economic
development of the district. Majority of the agricultural holdings were small and
marginal (size of land holding with ha.) which accounted for 80.8 per cent of the total
holdings. In the other way, it can be said that the real development of agriculture in
the district is heavily based upon the interest and efforts of small, marginal and middle
size of land holdings who were owning more than three-fourth of the total agricultural
land in the district.
Social Attributes:

There has been a significant relationship between social characteristics and type of agriculture which aptly describes, who is the land owner/holding operator/decision maker and/or producer. There are seven social attributes suggested by the IGU Commission on Agricultural Typology are analysed to evaluate impact of social characteristics on agricultural typology of Chittoor district. The variables like the percentage of agricultural land under traditionally customary rights of tenure, under labour or share tenancy and under collective or state enterprises are very negligible in all over the district. All the agricultural land holdings (95%) are found as private individual ownership holdings in the entire district.

The size of agricultural holding in terms of the number of people actively engaged in agriculture is low which accounted for 2 persons per holding in the district. Spatially it ranges marginally between two and five persons per holding. Comparatively the higher size of land holdings, in terms of people, are found in the western upland region. As per the classes of world ranges, all the mandals in the district came under the low and very low size of holding. The size of agricultural holding in terms of agricultural land is very low in Chittoor district which accounted for 1.58 hectares per holding. Spatially, it varies from a maximum of 5 hectares per holding in Nimmanapalle mandal to a minimum of 0.7 hectares in Nindra Mandal. The large number of agricultural holdings and limited agricultural land accounted for the low and very low size of agricultural holdings in the district which indicated the small nature of farming.
The size of agricultural holding in terms of gross agriculture output is very low in the district which accounted for 38 c.u. per agricultural holding. Spatially, the gross agricultural output per agricultural holding varies from a maximum of 67 c.u. in Thavanampalle Palle mandal to a minimum of 7 c.u. in kammapalle mandal. As per the class of world ranges all the mandals in the district came under very low category. The very low gross agricultural output per agricultural holding is not uncommon in the district due to predominant nature of small scale agriculture.

All the social attributes in combination with one another have revealed that the land is operated by its private owners and the nature of farming is small scale.

**Operational Attributes:**

The operational attributes are those that respond to the question of how a produce is obtained and what means and practices are employed to obtain agricultural production. It emphasizes that what are the labour and capital inputs and what is the intensity of their use. It includes seven variables which combinely and correlatively emphasizes the predominant organisational and technical practices that operate the land holdings to achieve agricultural production.

The inputs of human labour and animal power are high to very high in all the mandals of Chittoor district except Thavanampalle and Somalia mandals where the input of animal power is low. It is a better evidence to indicate the fact that the agriculture operation trend in Chittoor district is characterised by labour intensive with animal power combination.
The average input of mechanical power is calculated to 21 H.P. per 100 hectares of cultivated land. However, it varies from a maximum of 168 H.P. in Thavanampalle mandal to a minimum of 2 H.P. in Gurramkonda mandal. Moderate to very high input of mechanical power is found in half of the total mandals distributed in central and eastern regions of the district. Low and very low inputs of mechanical power consumption are found in 50 per cent of the total mandals located mostly in the western upland region. The average consumption of chemical fertilizers per hectare of cultivated land is 151 kgs. There has been a significant variation in the consumption of chemical fertilizers per hectare of cultivated land which varies from a maximum of 468 kgs in Kammapalle mandal to a minimum of 31 kgs in Pichatur mandal. High to very high consumption of chemical fertilizers per hectare of cultivated land is found in 46 mandals which are mostly located in eastern and central regions of the district. Low to moderate consumption of chemical fertilizers is found in many mandals located in the western upland region. Here the extensive cultivation of dry crops, scanty irrigation facilities and frequent occurrences of drought have had a shattering effect on the consumption of chemical fertilizers.

The intensity of irrigation is moderate in the district which accounted for 41 per cent of total cultivated area. But spatially, it ranges from a maximum of 95 per cent in Srikalahasti mandal to a minimum of 9 per cent in Pedda Tippa Samudram mandal. High to very high intensity of irrigation is found in 23 mandals, completely located in the eastern plains of the district. Moderate intensity of irrigation is found in many mandals located in the western upland region. The low and precarious rainfall conditions, low ground water potential and absence of canal irrigation are the restrictive factors for low intensity of irrigation in the western upland region. The intensity of cropland use is moderate to very high in all the mandals of the district.
Comparatively, the high and very high intensities of crop landuse are found in many mandals in the eastern and central regions, while moderate intensity of cropland use is noticed in the mandals located in the western region. In the western region, the spatial spread of fallow lands are significant.

The intensity of livestock breeding is high to very high in all the mandals of the district. Though the livestock breeding is a neglected branch of agriculture in general in the country, it forms a significant part of rural agricultural economy in Chittoor district.

Pertaining to operational attributes, it is found that there has been a significant spatial variation in their distribution in the district. Many parts of the eastern plain region are conspicuously distinguished from the other parts of the district in the distribution of the other parts of the district in the distribution of high inputs of operational attributes due to favourable physical and socio-economic conditions. The transitional zone between the eastern plains and the western uplands i.e., the central region is significant in the inputs of mechanical power consumption, chemical fertilizer, intensity of irrigation, cropland use and livestock breeding. Most of the western upland region is poorly endowed with many of operational attributes due to environmental constraints and poor socio-economic conditions of the farmers.

Production Attributes:

Production characteristics of agriculture respond to the question of how much, what and for what purpose it is produced i.e. what are the effects of agriculture and
disposal of its products. The production attributes include seven variables which explain the productivity of agriculture in different ways.

The land productivity in terms of gross agricultural output per hectare of agricultural land is 24 c.u. in the district which is classified moderate productive capacity of the land as per the classes of world ranges. The highest land productivity per hectare of agricultural land (50 c.u.) is found in Thavanampalle mandal, while the lowest (7 c.u.) in Kurabalakota mandal. Moderate to high and productivity is found in 48 mandals, distributed in central and eastern parts of the district. Low productivity of agricultural land is found in 18 mandals, located mostly in the western upland region. The productivity of cultivated land is also moderate in the district which accounted for 33 c.u. per hectare. The moderate to high productivity of cultivated land is largely found in central and eastern regions of the district. In these areas, the development of irrigation, moderate to high rainfall conditions and intensive application of technological inputs have had a striking influence on high degree of productivity of cultivated land. The low land productivity in the western upland region is due to spectacular spatial spread of dry farming depending upon low and precarious rainfall conditions. Here, the application of technological inputs is also very low.

Labour productivity in terms of gross agricultural output per person, engaged in agriculture, is very low in the district which accounted for 16 c.u. per person. The highest labour productivity (28 c.u. per person) is found in Thavanam Palle mandal, while the lowest (8 c.u. per person) in Kurabalakota and Santhipuram mandals. All the mandals in the district are found with very low labour productivity. The commercial labour productivity in terms of commercial agricultural production is 12 c.u. per person in the district, which is also considered as the very low commercial labour productivity.
At mandal level, the commercial labour productivity varies from a maximum of 24 c.u. per person in Thavanampalle mandal to a minimum of 5 c.u. per person in Tirupati Urban, Tirupati Rural, Kurabalakota and Santhipuram mandals. All the mandals in the district are found with low to very low commercial labour productivity. The very low labour productivity in all over the district is due to very high application of labour power in agriculture, limited agricultural space and large number of small size of land holdings.

The degree of commercialisation indicates the transformation of agriculture from the traditional subsistence economy to market oriented economy. It is measured as the percentage of commercial agricultural production in gross agricultural output. Chittoor district is significant for commercial farming which is evident from the fact that the average degree of commercialisation is 76 per cent in total agricultural production of the district. There has been a significant variation in the degree of commercialisation which varies from a maximum of 90 per cent in Thavanampalle and Irala mandals to a minimum of 54 per cent in Narayanavanam mandal. High to very high degree of commercialisation is found in as many as 51 mandals, mostly located in the central and western regions. In these areas the cultivation of cash crops like sugarcane, groundnut and garden crops as well as small scale dairy and poultry farming have a striking impact on the degree of commercialisation. Moderate degree of commercialisation is found in 15 mandals, distributed in the eastern plains of the district where food production is dominant. Commercial land productivity as the amount of commercial agricultural production per hectare of agricultural land is moderate in the district which accounted for 18 c.u. per hectare. Spatially, it varies from a maximum of 45 c.u. per hectare in Thavanampalle mandal to a minimum of 4 c.u. in Kurabalakota mandal. High commercial land productivity as per the classes of
world ranges is found in 7 mandals, located in the central region. But the moderate commercial land productivity is spread all over the district by accounting about 73 percent of the total mandals of the district.

The average degree of specialization in Chittoor district is 0.35 which is considered as medium. However, it varies from a maximum of 0.79 in Peddamandyam mandal to a minimum of 0.14 in Kuppam mandal. High degree of specialization is found in 23 mandals and moderate degree of commercialisation is found in 39 mandals. It is observed that the most of the district is found with moderate to high degree of specialization of farming.

From the analysis of production attributes, it is inferred that there has been a distinct variation in the distribution of different productivity levels as is influenced by distinguished physico-socio-economic and technological factors. Many parts of the central region are found with high land productivity, commercial productivity and degree of commercialisation. The eastern plains are significant in moderate to high land productivity, moderate degree of commercialisation and commercial labour productivity, which are due to high orientation of food grains farming and more number of small size of land holdings. The western upland region is significant for high degree of commercialisation and specialization due to spectacular spatial spread and groundnut production. But, this region is found with low land productivity due to obvious factors of rainfed cultivation and low level of technology input application.

**Structural Attributes:**

Structural attributes indicate the leading elements of agricultural production which are usually called orientation of agricultural commodities and livestock. Structural attributes consist of seven variables.
The area under perennial and semi-perennial crops in the district is 11 per cent in the total agricultural land which is indeed a low proportion. Spatially, it ranges from a maximum of 39 per cent in B.Kothakota mandal to a minimum of 2 per cent in Kurabakalkota and Peddamandyam mandals. As per the classes of world ranges, medium proportion of perennial cropping is found in 11 mandals which are mostly located in the central region. Here, the significant proportion of sugarcane cultivation, mango gardens, high concentration of tamarind tree population together accounted for the significant proportion of land under perennial and semi-perennial crops. In the rest of 55 mandals the land under perennial and semi-perennial crops is low to very low.

The average proportion of permanent grass lands in the district is accounted for 31 per cent of the total agricultural land. The highest percentage of gross lands (59%) is found in Tirupati rural mandal, while the lowest (3%) in Molakalacheruvu mandal. More than 75 per cent of the total mandals in the district are found with low to very low proportion of grasslands.

The average proportion of the area under primary food crops in Chittoor district account for 27 per cent of the total agricultural land which is indeed a low proportion as per the normalised values of the typological classification. It further indicates that the subsistence nature of the agriculture is not significant in the district. There has been a significant spatial variation in the distribution of land under food crops in the district which varies from a maximum of 82 per cent in Nagalapuram mandal to a minimum of 9 per cent in Thavanampil mandal. Only one-fourth of the total mandals, located mostly in the eastern plains, are noticed with moderate to high proportion of land under primary food crops. Paddy is the predominant food grain crop in the eastern plains.
The district is rich in livestock breeding, but very poor in animal production as percentage of crops agricultural output. On an average, the district has got 8 per cent of animal production in the gross agricultural output. The highest percentage of animal production (67%) in the gross agricultural output is found in Tirupati urban mandal, while the lowest (3%) in Tamballapalle mandal. Except Tirupati Urban mandal, all the mandals in the district are found with low to very low proportion of animal production in the gross agricultural output. The proportion of commercial animal production in the total commercial agricultural production is also very low in the district which accounted for 6 per cent. Except Tirupati Urban mandal (64 %) all the mandals in the district are found with very low proportion of commercial animal production.

The district is significant in industrial crop production which is an evident from the fact that the industrial crop production accounted for 56 per cent in the total agricultural production. The highest proportion of industrial crop production (88%) is found in Peddamandyam mandal, while, the lowest (14%) in Tirupati Urban mandal. High to very high proportion of industrial crop production is found in 31 mandals which are mostly distributed in the western and central regions of the district. In these two regions, groundnut and sugarcane are the chief industrial crops cultivating on an extensive scale.

In Chittoor district the herbivorous animal population accounted for 98 per cent of the total livestock population which is a very high proportion indeed.

The landuse orientation focusing towards perennial cropping grass lands, and primary food crops is low to moderate. There is a low emphasis on animal production
both in the total agricultural output and commercial output in all over the district. The orientation of industrial cropping and production is highly significant in general, but predominant in particular, in western and central regions of the district.

**Typification of Agriculture And Typological Regions:**

In the present study, the identification of agricultural types is based upon the method worked out by the IGU Commission on Agriculture Typology. On the basis of deviation procedure, the agricultural types of first order, second order and third order and third order are identified for all the 66 mandals of the Chittoor district.

**Agricultural Types of First Order:**

There are three different types of agriculture of first order identified in Chittoor district, out of which, the Traditional Small Scale (peasant) Agriculture - 'T' is the most prevalent first order agricultural type, found in 91 per cent of the total mandals of the district. Market-Oriented Agriculture - 'M' is identified in three mandals, namely, Gudipala, Thavanampalle and Pakala which are located in central region of the district. The intermediate agricultural type, transitional between 'T' and 'M' is found in three mandals, namely, Gangadhara Nellore and Penumuru located in the central region and Renigunta mandal in the eastern region.

**Agricultural Types of Second Order:**

There are two different types of agriculture of second order identified in the Chittoor district. 'Tm' type is identified in 37 mandals which accounted for 62 per cent of the total mandals of the district. These mandals are distributed in western,
southern-western, northern and eastern parts of the district. This type of agriculture in
western region is significantly emphasized by high degree of commercialisation with
low to medium land productivity and low to medium capital inputs. While, in the
eastern region, this type of agriculture is represented by high capital inputs, moderate
to high land productivity and moderate commercialisation. This has been the typical
form of agriculture of small and marginal farmers of the district. 'Tf' type is spread
over 29 mandals in central and eastern parts of the district. This type of agriculture is
caracterised by land owner operated, high inputs of labour and animal, moderate to
high capital inputs, moderate to high land productivity, high degree of
commercialisation and specialization and moderate perennial or semi-perennial tree
crop orientation. In these areas, sugarcane is the most predominant semi-perennial
crop which is cultivated without rotation for several years.

In the determination of agricultural types of second order, the variables like
land, crop and animal orientation, the level of productivity and degree of
commercialisation have significantly played a major role in the district.

Agricultural Types of Third Order:

There are five different types of agriculture of third order identified in Chittoor
district.

1. 'Tmy' agricultural type forms the largest typological region spread over 45
mandals in the district. This type of agriculture in the district is characterised by
traditional small scale labour intensive agriculture with considerable use of animal
power, high density of animal population, low to high capital inputs, medium land
productivity, very low labour productivity, high degree of commercialisation and medium to high industrial crop production.

2. 'Tis' agricultural type is identified in 11 mandals located in the eastern plains. In the order of importance, this is the second largest typological region in the district. This type of agriculture in the district is characterised by traditional scale owner type agriculture with high labour intensive, high input of animal power, moderate to high capital inputs, irrigated, medium productive, semi-commercial specialized crop (paddy and groundnut) agriculture with intensive crop land Utilisation.

3. 'Tir' type of agriculture is identified in 8 mandals mostly located in north-western part of the district. This is the third largest typological region found in the district. By considering all the taxonomic characteristics of agriculture of the present region from the world model type 'Tir', the present agricultural type is characterised by land operated by its owners, high inputs human labour and animal power, very low mechanization, low chemical fertilizer application and low irrigation, low productive, semi-commercial crop agriculture with marked orientation towards industrial crop farming.

4. 'Tmk' agriculture type is identified in Tirupati Urban mandal only. This is the only mandal in the district found with high proportion of urban population. The 'Tmk' agricultural type in this mandal is represented by traditional small scale owner type agriculture with high inputs of labour and animal power, low to medium capital inputs, irrigated, high land but very low labour productivity, low to moderate
commercialisation, high proportion of pasture lands, low proportion of food crops and high proportion of animal production in commercial production.

5. 'Mmc' type of agriculture is found in Thavanam Palle mandal only which is located in the central region of the district. The Mmc type of agriculture in this mandal is characterised by market oriented small scale high labour intensive agriculture with high capital inputs, high land productivity but low labour productivity, and high commercialisation but medium specialization, with prevalence of crop grouping.

In Chittoor district the preponderance of certain agricultural characteristics namely, the type of ownership, the size of holding, application of labour and animal power, level of capital inputs, levels of land and labour productivity, degree of commercialisation and orientation of cropland use and commercial animal emphasis have had a strong influence in the determination of agricultural types of third order.

**Agricultural Types of Sample Villages**

To achieve the objectives of the present study, 12 sample villages were selected from different parts of the district and identified the types of agriculture of different orders. There are two types agriculture of first order identified in the sample villages. As usual, the traditional small scale Agriculture (T) is more prevalent in all the sample villages except Greamspet and Aravakothur. Greamspet village located in Central region which is very near to Chittoor Urban settlement and Aravakothur village located in the eastern plains which is very near to Srikalahasti Urban settlement are found with Market - Oriented Agriculture (M).
Agricultural Types of Second Order of Sample Villages:

There are two types of agriculture of second order identified in the sample villages. 'Tf' agriculture type is identified in seven villages namely, Damalcheruvu, Timmi Naidu Palem, Aravakothur, Mathyam, Kalikiri, Ramasamudram and Greamspet. Semi-perennial tree crop dominant (sugarcane) is more prevalent in Mathyam and Greamspet villages. But, the other sample villages did not indicate any specialization in tree cropping, but are however specialized in industrial crop growing. 'Tm' type of agriculture is found in five sample villages namely, Karlagatta, Keelagaram, N.R.Agraharam, K.V.Palle and Burakayalakota.

Agriculture Types of Third Order of Sample Villages:

There are four types of agriculture of third order identified in the sample villages.

1. 'Tmy' type of agriculture is found in five villages namely, Aravakothur, Karlagatta, Ramasamudram, Timmi Naidu Palem and Burakayalakota. Comparing it with the world model type, it is found that instead of low commercialization and high proportion of food crops as mentioned in the case of world model type, the sample villages are characterised by moderate to very high commercialisation and low to moderate proportion of food crops.

2. 'Tis' agricultural type is found in two villages namely, Keelagaram and N.R.Agraharam. Both the villages are located in the dominant paddy growing area of eastern plains. The 'Tis' agriculture in these two villages is characterised by traditional small scale labour intensive irrigated, low to medium productive, semi-commercial crop agriculture with predominant proportion of food crop growing.
3. 'Tiu' agriculture type is found in four villages, namely, Mathyam, Damalacheruvu, Kalikiri and K.V.Palle. The 'Tiu' type of agriculture in Mathyam and Damalcheruvu (located in central region) is characterised by traditional small scale agriculture with high labour input, moderate input of animal power, moderate to high capital inputs, highly irrigated, high productive and high commercialized crop agriculture. In the other two villages (K.V.Palle and Kalikiri) which are located in the western upland region, the 'Tiu' type is characterised by traditional small scale labour and animal intensive, low capital inputs, semi-irrigated, medium land productive and high commercialized crop agriculture.

4. 'Mmi' agricultural type is found the Greamspet village only. This mandal is specialized with high proportion of animal products both in gross agricultural production and commercial agricultural production. The development of poultry farming both for chicken and egg production is more prevalent in this village.

_Agriculture Types of Sample Agricultural Holdings:

The present study is comprised of 210 sample agricultural holdings, which were taken from 12 sample villages belonging to different farming communities (forward community, backward community and scheduled caste/tribes). Agricultural types of different orders are identified in all the agricultural holdings and then compared.

_Agriculture Types of First Order of Sample Agriculture Holdings:

There are two types of agriculture of first order identified in all the sample agricultural holdings. Traditional Small Scale (Peasant) Agriculture-T is identified in 88 per cent
of the total sample agricultural holdings. It is worthwhile to mention that 77.6 per cent of the forward community holdings, 94 per cent of the backward community holdings and 100 per cent of the scheduled castes/tribes are identified with 'T' type of agriculture. Market-oriented Agriculture - M is found in 12 per cent of the total sample Agriculture holdings. Out of the 25 agricultural holdings who were identified with market oriented agriculture, 76 per cent belong to forward community and rest of the 24 per cent belong to backward communities.

Agricultural Types of Second Order of Sample Agriculture Holdings:

There are seven types of agriculture of second order identified in the sample agricultural holdings.

1. 'Tm' type of agriculture is found in 53.5 percent of the total sample agricultural holdings. As per the community wise distribution, 'Tm' agriculture is practiced by 73.1 percent of the holdings of scheduled caste/tribes, 60 per cent of the holdings of the backward community and 42.4 per cent of the holdings of the forward community.

2. 'Tf' agricultural type is found in 26.2 per cent of the total sample agricultural holdings. This type is being identified by 41 per cent of the holdings of the forward community, 19 per cent of the holdings of the scheduled caste/tribes and 15 per cent of the holdings of the backward community.
3. ‘Ti’ type of agriculture is found in 8.6 per cent of the total agricultural sample holdings. It is interesting to note that all the holdings who were identified with ‘Ti’ type belonged to backward community only.

4. ‘Ts’ agricultural type is found in four sample agricultural holdings belonged to backward community (3 holdings) and forward community (one holding).

5. ‘Mi’ type of agriculture is found in 9 sample holdings who belonged to forward community (6 holdings) and backward community (3 holdings).

6. ‘Mm’ type of agricultural is found in four agricultural holdings and all of them belonged to forward community.

7. ‘Mi’ type of agriculture is found in six agricultural holdings, out of which, three holdings belonged to forward community, two holdings to scheduled caste/tribes and one holding to backward community.

Agricultural Types of Third Order of Sample Agricultural Holdings:

There are 12 types of agriculture of third order identified in all the sample agricultural holdings.

1. ‘Tis’ type of agriculture is identified in 75 per cent of the sample agricultural holdings. This indicates that ‘Tis’ type is the most predominant type of agriculture of third order in the sample holdings found in all the sample villages. It is interesting to
mention that 92 per cent holdings of the scheduled caste/tribes, 88 per cent holdings of the backward community and 54 per cent holdings of the forward community were identified with 'Tis' type.

2. 'Tmy' agricultural type is the second most important third order type found in 18 sample agricultural holdings distributed in seven sample villages. About 14 per cent of the holdings of the forward community, 5 per cent of the backward community and 4 per cent of the scheduled caste/tribes are connected in the formation of 'Tmy' type.

3. 'Tir' agricultural type is represented by two holdings and who belonged to forward community (1 holding) and backward community (1 holding).

4. 'Tiu' agricultural type is found in two agricultural holdings and both of them belong to forward community.

5. 'Tmm' type of agriculture is found in one agricultural holding only and it belonging to forward community.

6. 'Tmk' type of agriculture is also found in one agricultural holding, belonging to forward community.

7. 'Mmm' type of agriculture is found in 15 agricultural holdings. This is the most important type of agriculture pertaining to Market-Oriented agriculture. The agricultural holdings which are represented 'Mmm' type are mostly belonged to
forward community (12 holdings) and the rest are confined to backward community (3 holdings).

8. 'Mim' type of agriculture is found in four agricultural holdings and all of them belonged to forward community.

9. 'Mmc' types of agriculture is noticed in two agricultural holdings which belonged to forward community.

10. 'Mif' type of agriculture is found in four agricultural holdings, out of which, two holdings are belonged to forward community, one to backward and one to scheduled caste/tribes.

11. 'Mmi' type of agriculture is found in three agricultural holdings, out of which two holdings belonged to backward community and one holding to forward community.

12. 'Mmi' type of agriculture is noticed in one agricultural holding which belongs to forward community.
CONCLUSION:

In the present investigation after analysing the agricultural types of various order pertaining to mandals, sample villages and sample agricultural holdings, it is found that the agriculture in the district is in the process of transformation from traditional to market oriented agriculture. The present formation and development of agriculture in the district is in the transitional stage consisting the combination of both traditional and market-oriented agricultural characteristics. Though the Chittoor district emphasizes the traditional agricultural characteristics in terms of social attributes, high labour and animal power application and very low labour activity but the other characteristics of agriculture namely, moderate to high capital inputs, intensity of irrigation, moderate to high land productivity, high degree of commercialisation and specialization, low proportion of land under primary food crops and high concentration of commercial crops especially industrial crops (groundnut and sugarcane) have been significantly transforming the agricultural scenario of the district from the traditional small scale labour intensive, low productive subsistence agriculture to traditional small scale labour intensive, high capital inputs, high productive and specialized commercial agriculture. This is a good high indeed in the process of agricultural transformation in the district.

There has been a significant variation in the formation and development of agriculture among the mandals, sample villages and sample agricultural holdings. The agricultural weak links, as indicated by the low and very low values of all the taxonomic characteristics of agricultural types revealed that most of the weak links are related to social attributes, Structural attributes, level of mechanization, chemical fertilizer application and irrigation in the operational attributes, and land productivity and labour
productivity in production attributes. The weak links relating to social attributes and structural attributes are more or less uniform in all the mandals, sample villages and sample agricultural holdings. The real differences in agricultural weak links are found in operational and production attributes. More number of agricultural weak links relating to operational and production attributes are found in many of the mandals located in the western upland region. The high number agricultural weak links in the western upland region indicated the low development of agriculture. The sample villages located in the western upland region have shown more number of agricultural weak links than the other sample villages. Hence, an attention is to be made to develop the western upland region by improving the capital inputs like mechanization, fertilizer application and irrigation. The land productivity is also to be improved with the help of (i) dry farming techniques, (ii) application of better soil and water conservation methods, (iii) extension of irrigation by conjunctive use of both surface and sub-surface water resources, (iv) suitable cropping pattern with inter-cropping methods, (v) diversified agricultural activities like cropping, sericulture, animal husbandry and agro-forestry, and (vi) improved socio-economic conditions of the farmers.

In the case of sample agricultural holdings, majority of the holdings belong to scheduled caste/tribes and backward community were intimately connected with the formation of traditional mixed agriculture. In contrast to this, the agricultural holdings belonging to forward community are found in the development of different forms of agriculture confining to the both traditional and market-oriented economy. It is worthwhile to mention that the different types of market-oriented agriculture is found almost in the holdings of the forward community. On an average the total agricultural weak links is low (13 weak links) in the holdings of the forward community, while weak
links are more in backward community (15 weak links) and in scheduled caste/tribes (17 weak links). The low level of mechanization, very low fertilizer application, low irrigation, low to medium land productivity, very low labour productivity, medium commercialisation and specialization and very low commercial emphasis are the distinctive characteristics of the agriculture of the holdings belonging to scheduled caste/tribes in total and to backward communities in partial. In the case of forward community the agricultural holdings are characterised by medium to high inputs of labour and animal power, high capital inputs, high irrigation, high to very high land productivity, medium labour productivity, very high commercialisation and specialization oriented towards both commercial crops and animal emphasis. In this regard it is obvious to state that the socio-economic conditions of farmers belonging to small and marginal as well as middle farmers have been significantly influencing the formation and development of prosperous and opulent agriculture. To alleviate the agricultural weak links of the small and marginal farming community, concerted efforts are to be made to improve the institutional factors such as financial assistance, education and improvement of agrarian relations which are no way less importance for agriculture development.

In conclusion, it may be stated that the Chittoor district has considerable agricultural potentiality for further development of agriculture and modern and scientific lines. Agricultural development in the district calls for greater attention to be paid to the small and marginal farmers on one side, and to the development of livestock resources on the other hand, because the district is known for small size of land holdings and also rich in animal resources. Through the application of necessary agro- technological inputs, sustainable agricultural development can be brought in the small size of land holdings. To achieve this task two essential objectives - 'efficiency'
and 'diversification' should guide the application of the available agro-technologies. Efficient use of land, water, crop, animal and other allied resources according to their potentials and limitations is necessary through improved resource assessment and monitoring. Diversification of agricultural activities into sustainable cropping patterns, commercial animal emphasis at intensive small scale level, sericulture in the suitable climates and sylviculture in the agricultural fallow lands is necessary especially in the case of small and marginal farmers to solve both the environmental and socio-economic problems created by mono- cultures and very high specialization to make the maximum use of available bio-diversity to adopt agriculture to the changing environments and adverse conditions. There is high hope for the regionalisation of agriculture on scientific lines in the district for developing itself into prosperous agricultural district: